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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,200	03/14/2001	William P. Moore	BU9-98-050DIV1	2598
21254	7590	10/13/2004	EXAMINER	
MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			GERSTL, SHANE F	
			ART UNIT	PAPER NUMBER
			2183	

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/805,200	Applicant(s) MOORE ET AL.	
	Examiner Shane F Gerstl	Art Unit 2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,9,20 and 23-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-4, 6, 9, 20, and 23-30 have been examined.

Papers Received

2. Receipt is acknowledged of amendment papers submitted, where the papers have been placed of record in the file.
3. The amendment and remarks have successfully overcome the objections to the drawings and title, which are herein withdrawn.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Damouny (4,713,750).
6. In regard to claim 20, Damouny discloses a method of providing a state machine decoding, comprising:
 - a. decoding a current opcode to provide a decode; [Column 3, lines 41-49 and column 4, lines 30-35 show that an opcode is mapped or decoded.]
 - b. setting required functions signals; [This section also show that the pointers are necessary for execution and thus are required functions signals]
 - c. setting exclusive functions outside of the current opcode to a previous state; [Column 18, lines 1-8 show that pointers generated by previous

instructions (outside the current opcode) pass through other latches, thus functionally setting these exclusive DODA and EXEC latches to a previous state (due to the previous instructions))

d. and latching results of the decode. [Column 4, lines 35-38 show that the pointers resulting from the decode are stored in a latch.]

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 6, 9, and 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Damouny in view of Thoma (4,484,268).

9. In regard to claim 1,

a. Damouny discloses a microprocessor, comprising: a microcode unit (figure 1A, element 54) for outputting control signals (element 182), for each of a plurality of instructions, required by said microprocessor for executing said instructions, the microcode unit comprising:

i. an instruction address input for receiving an instruction address;
[Figure 1A shows that element 156 (and thus the microcode unit) receives addresses on an input via line 168, which is output by element 164, for the next microaddress or microinstruction address.]

- ii. a control variable input for receiving a control variable corresponding to a current state of the microprocessor; [Figure 1A shows that the microcode unit has a control variable input 184. Column 4, lines 57-61 show that the input signals received on bus 184 correspond to and control the internal state.]
- iii. a control signal input for receiving all the control signals output by the microcode unit for an immediately preceding instruction; [Figure 1A shows that element 180 (and thus the microcode unit) receives on an input the control signal 182, which is output by element 164 and thus the microcode unit. Column 4, lines 57-61 show that this signal 182 is a control signal. Column 18, lines 1-8 show that the signal on bus 182 is generated in previous instructions and supplied in a next cycle.]
- iv. An embedded logic circuit dedicated for evaluating one unique type of instruction received by the microcode unit and for setting the control signals required for executing said received instruction. [Figure 1A shows an embedded logic PLA circuit 180 that decodes branch conditions for branch instructions. Column 4, lines 53-61 show that this branch PLA generates the control for selecting the NMA or next microaddress based on branch conditions and thus evaluates branch instructions (a unique type of instruction). As shown in figure 1A, the branch PLA's 180 are responsive to the control variable (element 184), the control signals for an

immediately preceding instruction (element 182), and to the table lookup for setting the required control signals (element 183).]

- b. Damouny does not disclose a plurality of embedded logic circuits each dedicated for evaluating one unique type of instruction received by the microcode unit.
- c. Thoma has disclosed in figure 1 the use of multiple PLA embedded logic circuits. Column 2, lines 6-9 show that each PLA is optimized for decoding a given instruction class (or evaluating a unique instruction type).
- d. The background section of Thoma shows that prior art PLA decoding using only one PLA results in physically large design and performance degradation manifest in slower machine speeds. The summary shows that the improvement is in using multiple PLA's and thus this performance degradation is avoided. This ability to have a better performing or faster machine would have motivated one of ordinary skill in the art to modify the design of Damouny to use multiple PLA's for evaluating unique instruction types as taught by Thoma. With this methodology in place in the disclosure of Damouny, multiple PLA's would be used in place of the single branch PLA so that a PLA that is too large is avoided and no performance degradation occurs.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the design of Damouny to use multiple PLA's, as taught by Thoma, in place of the single branch PLA so that increased speed in the processing machine may be realized.

10. In regard to claim 2, Damouny in view of Thoma discloses the microprocessor according to claim 1, wherein each of the embedded logic circuits includes:

- a. a table for performing a table lookup in response to a received instruction;
[A PLA inherently uses a table. As reference of this inherency, the Hennessy (Computer Architecture) textbook explicitly shows on pages 205-206 that a PLA is a table with entries for lookup. In addition, Hennessy (Computer Organization and Design) has shown on pages B-11 to B-13 that a PLA includes a pair of tables, an AND plane and an OR plane. These tables are used to perform table lookups because the inputs into the AND table are transformed into intermediate values that fall down to the OR table and get further transformed into what results as the outputs.]
- b. and a controller responsive to the control variable, the control signals for an immediately preceding instruction, and to the table lookup for controllably setting each of the control signals required by the microprocessor for executing said received instruction. [As shown in figure 1A of Damouny, the branch PLA's 180 are responsive to the control variable (element 184), the control signals for an immediately preceding instruction (element 182), and to the table lookup for setting the required control signals (element 183). The tables use the control signals input to lookup the control signals to be output to element 156 via line 183.]

11. In regard to claim 3, Damouny discloses the microprocessor of claim 2, wherein the controller includes:

- a. means for setting a control signal to a "1" regardless of its immediately preceding value;
- b. means for setting a control signal to a "0" regardless of its immediately preceding value;
- c. and means for not modifying a control signal from its immediately preceding value.

[Column 3, lines 14-17 show that the control signals are set to active high ("1") and active low ("0"). Since limitations (a) and (b) of the claim state that this setting is regardless of the preceding value, the value may or may not (regardless) be set based on the previous value and thus these limitations are met since all that is required is the setting of the control signals to a "1" and to a "0". When the control signal of mention does not change from one instance to the next, the control signal is set to the same value as before and is not modified *from the previous value*, but is modified to retain the value.]

12. In regard to claim 4, Damouny discloses the microprocessor of claim 3, wherein the controller further includes: means for setting a control signal to a data state. [As shown above, the control signals are set to active low or active high, a "0" or a "1" respectively. Since a "1" or "0" bit is data, the control is set to a data state.]

13. In regard to claim 6, Damouny discloses the microprocessor according to claim 1, further comprising means for determining which of the control signals are not to be modified for each instruction. [Since the disclosure of Damouny is of a standard architecture where the control signals are set for each operation, every control signal is

modified for each instruction, though some are modified at times to be the same value as a preceding signal. Thus it is determined that none of the control signals are to be not modified, since each signal is set. This would then inherently mean that there is means for determining that no control signals are to not be modified since the system automatically modifies all control signals, whether the determination is hardwired and is the same determination every time or otherwise.]

14. In regard to claim 9,

a. Damouny discloses a microcode unit in a microprocessor (figure 1A, element 54) for outputting control signals (element 182), for each of a plurality of instructions, required by said microprocessor for executing said instructions, the microcode unit comprising:

- i. an instruction address input for receiving an instruction address;
[Figure 1A shows that element 156 (and thus the microcode unit) receives addresses on an input via line 168, which is output by element 164, for the next microaddress or microinstruction address.]
- ii. a control variable input for receiving a control variable corresponding to a current state of the microprocessor; [Figure 1A shows that the microcode unite has a control variable input 184. Column 4, lines 57-61 show that the input signals received on bus 184 correspond to and control the internal state.]
- iii. a control signal input for receiving all the control signals output by the microcode unit for an immediately preceding instruction; [Figure 1A

shows that element 180 (and thus the microcode unit) receives on an input the control signal 182, which is output by element 164 and thus the microcode unit. Column 4, lines 57-61 show that this signal 182 is a control signal. Column 18, lines 1-8 show that the signal on bus 182 is generated in previous instructions and supplied in a next cycle.]

iv. And an embedded logic circuit dedicated for evaluating types of instructions received by the microcode unit and for setting the control signals required for executing said receiving instruction. [Figure 1A shows a PLA element 150 that maps instructions or decodes opcodes. Column 4, lines 33-35 show that this mapping generates pointers necessary for execution and address calculation and thus the instructions are evaluated to generate these pointers. Column 3, lines 41-439 show that this one unit maps or evaluates for each instruction given in appendix B. As shown in figure 1A, the branch PLA's 180 are responsive to the control variable (element 184), the control signals for an immediately preceding instruction (element 182), and to the table lookup for setting the required control signals (element 183).]

b. Damouny does not disclose a plurality of embedded logic circuits each dedicated for evaluating one unique type of instruction received by the microcode unit.

c. Thoma has disclosed in figure 1 the use of multiple PLA embedded logic circuits. The summary shows that the PLA's decode the opcodes of instructions.

Column 2, lines 6-9 show that each PLA is optimized for decoding a given instruction class (or evaluating a unique instruction type).

d. The background section of Thoma shows that prior art PLA decoding using only one PLA results in physically large design and performance degradation manifest in slower machine speeds. The summary shows that the improvement is in using multiple PLA's and thus this performance degradation is avoided. This ability to have a better performing or faster machine would have motivated one of ordinary skill in the art to modify the design of Damouny to use multiple PLA's for opcode decoding as taught by Thoma.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the design of Damouny to include multiple PLA's as taught by Thoma so that increased speed in the processing machine may be realized.

15. In regard to claim 23, Damouny in view of Thoma disclose the microprocessor of claim 1, wherein each plurality of embedded logic circuits comprises a controller for controllably setting each of the control signals required by the microprocessor for executing said received instruction. [As shown in figure 1A, the branch PLA's 180 are responsive to the control variable (element 184), the control signals for an immediately preceding instruction (element 182), and to the table lookup for setting the required control signals (element 183).]

16. In regard to claim 24, Damouny in view of Thoma disclose the microprocessor of claim 1, wherein each plurality of embedded logic circuits comprises a controller for controllably setting only each of the control signals required by the microprocessor for

executing said received instruction. [As shown in figure 1A, the branch PLA's 180 are responsive to the control variable (element 184), the control signals for an immediately preceding instruction (element 182), and to the table lookup for setting the required control signals (element 183). One can see the added stipulation of "only" is met by the following example. In an example if a control word from the PLA table is "11 0000 0000 00 0000 0010 000" (as is the first output entry from the PLA in appendix B), the necessary bits that must be set to a "1" are bits 4, 21, and 22 (with zero being the first bit on the right) and these are the *only* bits set to a 1 in the control word and are the required ones for the corresponding instruction execution.]

17. In regard to claim 25, Damouny in view of Thoma discloses the microprocessor of claim 1, wherein each of the plurality of embedded logic circuits comprises a table that performs a table lookup in response to a received instruction. [A PLA inherently uses a table. As reference of this inherency, the Hennessy (Computer Architecture) textbook explicitly shows on pages 205-206 that a PLA is a table with entries for lookup. In addition, Hennessy (Computer Organization and Design) has shown on pages B-11 to B-13 that a PLA includes a pair of tables, an AND plane and an OR plane. These tables are used to perform table lookups because the inputs into the AND table are transformed into intermediate values that fall down to the OR table and get further transformed into what results as the outputs.]

18. In regard to claim 26, Damouny in view of Thoma discloses the microprocessor of claim 25, wherein said controller is responsive to the control variable, the control signals for an immediately preceding instruction, and to the table lookup. [As shown in

figure 1A of Damouny, the branch PLA's 180 are responsive to the control variable (element 184), the control signals for an immediately preceding instruction (element 182), and to the table lookup for setting the required control signals (element 183). The tables use the control signals input to lookup the control signals to be output to element 156 via line 183.]

19. In regard to claim 27, Damouny in view of Thoma discloses the microprocessor of claim 23, wherein the controller includes means for maintaining a control signal at an immediately preceding value of said control signal. [As shown above, since control signals are set, they are kept up to date or maintained.]

20. In regard to claim 28, Damouny in view of Thoma discloses the microprocessor of claim 27, wherein the controller includes:

- a. means for setting a control signal to a "1" regardless of its immediately preceding value;
- b. means for setting a control signal to a "0" regardless of its immediately preceding value;

[Column 3, lines 14-17 show that the control signals are set to active high ("1") and active low ("0"). Since limitations (a) and (b) of the claim state that this setting is regardless of the preceding value, the value may or may not (regardless) be set based on the previous value and thus these limitations are met since all that is required is the setting of the control signals to a "1" and to a "0".]

21. In regard to claim 29, Damouny in view of Thoma discloses the microprocessor of claim 28, wherein the controller further comprises means for setting a control signal

to a data state. [As shown above, the control signals are set to active low or active high, a "0" or a "1" respectively. Since a "1" or "0" bit is data, the control is set to a data state.]

22. In regard to claim 30, Damouny discloses the microprocessor according to claim 1, further comprising means for determining at least one of said control logic signals to be maintained at each instruction. [As shown above, since control signals are set, they are kept up to date or maintained. In this case it is determined that all are maintained as described in various arguments above.]

Response to Arguments

23. Applicant's arguments filed 7/16/04 have been fully considered but they are not persuasive.

24. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that only the required control signals are resolved or changed) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Because the transitional phrase of the claims is open-ended in using the term "comprising", the references may teach more than what is disclosed in the claim. For example, since the claims read that the required control signals are changed, the reference must teach that these control signals are changed, but may also disclose other control signals that are changed since the claim mentions nothing about the other control signals.

25. In response to applicant's argument that Damouny nor Thoma discloses, suggests, or even address the problems being solved by the claimed invention, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

26. In regard to claim 3 the examiner wishes to clarify the position on the claim. Column 3, lines 14-17 show that the control signals are set to active high ("1") and active low ("0"). Since limitations (a) and (b) of the claim state that this setting is regardless of the preceding value, the value may or may not (regardless) be set based on the previous value and thus these limitations are met since all that is required is the setting of the control signals to a "1" and to a "0". The third limitation has been given patentable weight counter to what the Applicant thought was the examiner's intention and the examiner had wished only to point out that regarding the first two limitations, the phrase "regardless of the preceding value" is inherently met since the signals will be either set based on the previous value or not based on the value. Regarding the third limitation, when the control signal of mention does not change from one instance to the next, the control signal is set to the same value as before and is not modified *from the previous value*, but is modified to retain the value.

27. In regard to claim 6, Applicant has argued that since Damouny discloses that every control signal is modified for each instruction, no determination would need to be made on which control signals are to be modified and which are not to be modified. As Applicant has admitted, Damouny discloses automatically modifying every control signal for each instruction. This would then inherently mean that there is means for determining that no control signals are to not be modified since the system automatically modifies all control signals, whether the determination is hardwired and is the same determination every time or otherwise.

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

29. The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the

claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references cited in the previous and current actions remain pertinent and are cited herein.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane F Gerstl whose telephone number is (571) 272-4166 after October 12 and (703) 305-7305 before October 12. The examiner can normally be reached on M-F 6:45-4:15 (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162 after October 12 and (703) 305-9712 before October 12. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Shane F Gerstl
Examiner
Art Unit 2183

SFG
October 5, 2004



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